

WHAT IS THE EFFECT OF HAVING A SUBSTITUTE TEACHER IN A SCIENCE  
OR MATH CLASS: IS IT A PRODUCTIVE CLASS?

by

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July 2011

## DEDICATION, ACKNOWLEDGEMENTS

In memory of my dear friend Kerry Henrickson I dedicate this paper. She was my inspiration to continue my education and get my masters. She inspired me to be a better teacher. Unfortunately she was unable to see me finish my degree since she passed away earlier this year. I know she will always be with me, in spirit, and in mind.

I want to send out thanks to Janet Thompson, Jennifer Caputo, Jim and Anne Lynch and other friends for helping me with all stages of my Capstone project.

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## ABSTRACT

In this study I looked at the effects of substitute teaching in science and math classes. There are several different points of view with regard to substitute teaching; the substitute teacher, the students, the contracted teacher, and the administration. I looked at the substitutes', the students', and the teachers' points of view on the effectiveness of substitute teaching. Most perceive that having a substitute is like having a "cake day." That should not be the case. What happens when they actually have to apply science or math? What happens when students are expected to learn from a substitute teacher? I looked at the students' attitudes, their acquired knowledge from a topic that I taught, their expectations, my expectations for them, and the expectations of the absent contract teacher.

## INTRODUCTION AND BACKGROUND

### Project Background

#### Teaching and Classroom Environment

For the past four years I had been teaching microbiology in a blended/hybrid format at a Community College in Arizona. With regards to my class it meant students would listen to lectures online and take unit quizzes on what they learned on-line. Then they would enter the face-to-face portion of the class where they would perform lab experiments and take tests. The students were always welcome to ask questions regarding the on-line portion of the class. In the middle of my Action Research project, I found out I was moving across the country to Vienna, Virginia where I would no longer have a class at my disposal. With the move I came across a dilemma of what and how to make a new Action Research project.

In the beginning of this process I wanted to implement technology within my research, but it wasn't that easy. With me not knowing any teachers that would allow me to come in and collect data from their classroom, I seemed to be at the end of the line. Unfortunately, I had a change in my life that I could no longer use my first plan for my research questions. I tried to make friends with science teachers and enter their classroom to implement the technology portion of my research, but no one was being responsive. With my move I had no idea of what types of questions to ask or even where I would be asking the questions. The only way that I thought to enter a classroom since all of my other options were exhausted was to apply to become a substitute teacher.

Since I do not have my own class I applied to be a substitute teacher at the local high schools and middle schools in the Vienna, Virginia. I also applied to substitute at a private school, Flint Hill School, which is located in Northern Virginia. With my circumstance, that was a way I could bring my science knowledge to students. I wondered if the attitudes were different about substitute teachers between the private school and public schools where I substitute taught. When I applied for the substituting job, I noticed the requirements or the lack of requirements needed to be a substitute teacher in the northern VA area were weak. The requirements for Fairfax County Public Schools substitutes are that you have a high school diploma, have completed 60 hours of college credits, and have three letters of character recommendations. There was no mention of the types of courses that needed to be taken or that you had teaching experience. The Fairfax County Public school district had requirements of recommendation letters of character and not teaching experience or ability. At Flint Hill School there were no listed steps that I needed to accomplish before I could substitute teach for them. All I needed to do was get invited to an interview, talk to the assistant faculty director and then be asked by her to become a substitute teacher. I handed my resume and transcripts, but she didn't ask for either of those. I had a brief interview with the Assistant Director. I told her about my qualifications, how I would handle certain classroom scenarios, and she told me I had the job. There appeared to be little thought as to putting me in a classroom setting. During the interview, they gave me a sheet that covered who I needed to meet with every morning, when I needed to be at school, what was expected to occur during the day, and the pay for substituting. Within this sheet it

was stated that if substituting in a high school class I was not obligated to teach the students unlike the elementary school which I was expected to teach.

There is a big demand for substitute teachers at all schools. Unfortunately there is also a lack of qualified substitute teachers. Substitutes need to be more effective and not just a glorified babysitter. Students do not want to have their time wasted and neither do the substitutes sitting in for the teachers. Does anyone else find it troublesome that we do not require more education or more specific or specialized education of our substitute science teachers?

While interviewing with the Assistant Faculty Director, I was told at the high school level I would not be required to actually “teach” the students. I would be given a movie to show or an activity for them to complete. I thought that to be strange since I am very capable of teaching their students, but I guess not all people who substitute are capable. It is my opinion that the time in class would be better spent with the students actually learning something. There must be a more effective way of being a substitute teacher and not wasting precious learning time. Within the middle and lower school, I was told to follow the lesson plans left by the contract teacher. I don’t think it would be too terribly difficult to accomplish the same thing at the high school level as long as they are given in some detail.

I do not believe someone strives to take on substitute teaching as a career, but I guess this is dependent upon the living situation of the person. Substitute teachers, for the most part, do not list themselves to teach only one subject, they have to be able to adjust to the different classes they are placed. A substitute doesn’t wear just one hat, but many.

Substitute teachers need to please many different groups; students, administration, and the teachers they are filling in for. Substitute teachers do not seem to be used efficiently or effectively. How do we go about making a class more productive when their teacher has to be out for the day?

The principals I talked to have the same concerns about having substitute teachers. The schools at which I substituted are Madison High School, Oakton High School, Thoreau Middle School, and Flint Hill School. The first three schools are part of Fairfax County Public School system which is the third largest district in the country. The middle school classes in which I was substitute teaching were grades 7 and 8. The high school classes included grades 9 through 12. The most recent school I substitute taught was Flint Hill School. Their mission statement is “We are striving for excellence in all that we do. To achieve that goal, we nurture and value the contributions of every individual member in our school family.” I have found that the students at Flint Hill School are a lot more focused on their studies. Flint Hill School offers classes from junior kindergarten to 12<sup>th</sup> grade.

It is my experience that students have two different personalities presented to the teacher or the substitute teacher in all of the schools in which I have been a substitute teacher. What is the best approach to being a substitute teacher? Do students respond differently and if so why is that? Why do they act in one way for substitutes and another way for their permanent teachers? How can we change students’ perspectives of substitute teachers?

During informal conversations with the substitute hiring committee and the Assistant to the Director of Faculty at Flint Hill School, I felt there was a much better

way to place substitute teachers in order to make sure they would be more effective in science and math classrooms. Does there need to be more specialized training in the field of science and math as a qualification to teach junior high and high school age students? I know that this question has been asked many times and the answer is probably yes. How do we achieve this without costing lots of money?

I substituted for the entire 2010-2011 school year at both public and private schools in the Northern Virginia area. I wanted to learn how both students and teachers perceive substitutes and also how I can become better at my substitute teaching. Specialized teachers find it much more difficult to find qualified substitutes. Can substitutes get training? Of course, but at what cost? Could there be mentors to help substitutes better fit in? Could substitutes get help with specific subjects that might need special training?

### Main Question

How can a substitute teacher enter a math or science class and be an effective teacher?

### Sub questions

What might be some techniques I could implement to gain students respect in a math or science classroom as a substitute teacher?

Is the teacher's knowledge of science or math linked to the students' behavior and attitudes in the class?

Does the length of time a substitute is in the classroom affect the attitudes towards the teacher?

There are many different perspectives from what is believed to be an effective substitute teacher. There are the student, teacher, substitute teacher, and administrative perspectives on the effectiveness of a substitute teacher. An effective substitute teacher is a teacher, who commands a presence of authority, bring enthusiasm to the classroom when teaching the students, and have the students learn.

### CONCEPTUAL FRAMEWORK

Substitute teaching is a two sided coin. We need them because the contracted teachers may need to be absent periodically during the school year because of illness or professional development. What happens to students when their teacher is absent for a period of time? What is a substitute's responsibility? How are substitutes chosen? The majority of articles that I found were focused on how to substitute teach and how to get a substitute teaching job. These articles, of course, helped me on my day-to-day substituting jobs. During this conceptual framework section I will cover school district qualifications, teacher absences, information behind teacher absences, and the thoughts of substitute teachers in general.

However I wanted to compare districts around the country to see how they have made their substitutes more effective in a classroom. I also wanted to compare what different qualifications were required for substitute teachers. Substitute teachers are a very crucial part of the educational community. There is a shortage of contracted

teachers within the United States, which means there is an even greater need for substitute teachers. This is due to the low salaries that contracted teachers are given. Additionally, personal emergencies that everyone, even contract teachers, have in their lives reduce total contract teacher availability. Do we think there is an effect/impact on our students when their teacher is absent? By the end of a student's educational career many students will have had a substitute teacher for almost one year.

The need for qualified and supported substitute teachers stems from the contracted teacher being absent. Someone needs to step in and be an effective teacher to the students. School districts want our teachers to keep up with the times in the classrooms by going to conferences and/or meetings that might give the teacher better access to knowledge or teaching skills to pass on to our students. In 86% of the school districts in the United States there is a substitute shortage (Elizabeth, 2001). The process of hiring substitute teachers has changed throughout the years. One of the biggest questions that districts face is should substitute teacher candidates undergo the same screening process as regular teachers? In a survey conducted, 80% believe the screening should be improved; 17% believe the screening process is adequate (Elizabeth, 2001). With only limited screening for substitute teachers, some things tend to fall through the cracks. Student safety, costs, and background checks can be overlooked. I'm not for or against speedier hiring procedures. It has been shown that the states that use substitute teachers the most also have the fewest required qualifications for their substitute teachers (Elizabeth, 2001). Substitute qualifications have been dropping. Forty-nine states require no certifications meaning there is only one state that requires substitute teachers to have a teaching certificate. Twenty-eight states require only a high school diploma or a GED.

Fifty-six percent of school districts do not have face-to-face interviews. Twelve percent do not require applications. Thirty percent have no background checks. Fifty percent do not check references. Less than twenty percent of 500 school districts do not have formal evaluations of substitutes, and seventy-seven percent do not provide any formal training (Elizabeth, 2001).

After a substitute is hired what happens next? Less than 10% of school districts in the country actually have training for the substitutes. The ones that do have the training have found that the complaints about the substitute teachers have dramatically decreased.

Some states and counties are making it mandatory that even substitute teachers continue their education. In West Virginia, of 175 teachers reviewed, ninety percent had a professional certification, fifty-nine percent had less than four years of regular teaching experience, and sixty-eight percent had less than four years of substitute teaching (Bontempo, 2010).

Substitutes need to go through a better hiring process, be placed in classes in which they are comfortable teaching, be provided better training, have someone which they can go to for help, and be given clear direction that they are needed for more than just babysitting (Augustin, 1987). I know administrators want the best for their schools. They need to look at qualifications and the backgrounds of the people who are stepping in to substitute teach. Effectiveness of a substitute teacher should be a high priority on everyone's list because our children's education is so important.

As the dynamics in our schools change there will always be a need for substitute teachers. As the need for substitute teachers increases, we will need to change or

improve our process in hiring substitute teachers so our students in the United States aren't left behind. We wouldn't want other industrialized countries to have an advantage over our students in their efforts to be hired for jobs (Miller, 2007). Substitutes need to have background in teaching, childhood behavior, and at least a little bit of knowledge of the subjects they are willing to substitute teach. Students, contracted teachers, administrators, and even the substitute teachers must change the idea that a substitute is second rate or less effective than a contracted teacher. There also needs to be feedback from the administration, so a substitute knows what kind of job they are doing. This means the lines of communication need to be open.

The United States is the only country that has issues with contracted teachers and substitute teachers. The United States does not have the worst attendance for contract teachers, but it also is not the best. In developing world countries roughly 20% of the days the school is in session the contract teacher is absent. The percentage for the United States is 5%-6%. The UK and Queensland, Australia has the best percentage at 3.15% and 3.12% (Miller, 2007).

There is a correlation between teachers' absences and student productivity/success. Observed for a three year period of time was fourth grade math achievement in Ormondale School District in the Northern part of the United States. In addition to absences, another critical variable could be the quality of instruction. Instructional quality must also play a role with students being successful in math and science (Miller, 2007). When teachers are absent there seems to be a negative impact on the students. Three reasons may be (1) the lack of good substitute teachers, (2) instructional intensity changes, and (3) the disruption of the regular classroom routine

and procedure. It has been perceived, that when a teacher has a lot of absences they lack skill and effort, but with that notion it creates a bias to the study (Miller, 2007). There are some thoughts that there is a relationship between a teacher's performance and the rate in which he/she is absent, but is this really the case. Of course it could be a reason, but then there might be some other reasons for the rate of a teacher's absence from the class.

When there is an incentive such as a vacation buyback program or bonuses there seem to be less vacation time taken for unnecessary absents. It also has been found that secondary school teachers take off less time than their counter parts at the elementary school level (Miller, 2007).

Fourth grade Math achievement studied by Miller had some possible biases: variability in the qualifications of the contract teachers, variable demographics among the classrooms, differences in neighborhoods in the district, and possibly what might be causing the teachers to be missing school days. Quality of teaching or instruction could be a main factor instead of actual absences of the teachers.

During a study conducted by Miller, ( $N=174$ ) the teacher absences were examined through the following categories: teacher gender, days taken off, tenured verses non-tenured teachers, and even race. The reasoning behind this was not discussed within this study. With regard to which days were taken off, most frequently were Friday at 6% and Monday at 5.14%. The percentage was that of the teachers taking those days off. An example would be that 12 teachers out of 200 take Fridays off during the year. This study found that when instructional days were adjacent to a non-instructional day the highest rate of absences occurred. It is believed this was to help make the weekends or

time away from the classroom longer. Personal necessity was the main reason given as to why a teacher required an absence. On any given Monday or Friday 59.8% gave the reason of personal necessity; on any other day only 45.7% gave personal necessity as the reason for an absence. This percentage also has to do with the number of teachers who had taken a Monday or Friday and the reason they gave for being absent. Within this district, data showed that elementary school teachers were more frequently absent than the secondary school teachers. Within this particular study, whether a teacher was tenured or not also had an impact on absences. A tenured teacher was more likely to be absent than a teacher that was contracted on a year-to-year basis. Additionally, within this district the demographic distribution of teachers was 86% female, 32% African Americans, and 5% Hispanic. It was shown that African American teachers would be absent 3 more days per year than white teachers (Miller, 2007).

One way that absences were reduced occurred when there was an incentive given to the teachers, such as a leave buyback program. In India, over a year's span of time, a monetary incentive was given to teachers. When these incentives were implemented the test scores were found to be higher than when the incentives for the teachers were not. Looking at different countries absent rate it was found, a 42% absence rate in India which is much higher than that in the United States. The test scores for India were much lower than those in the United States. It was found in North Carolina if a teacher was out more than 10 days there was a decrease in student achievement by 1-2% of one standard deviation. Most of the students came from a community in which the students did not have the family resources to compensate for the significant absences of the contract teachers (Miller, 2007).

When contract teachers have a high rate of absence, there might be a degradation of the students state test scores. Within school districts today, there are over 100 million standard tests for students to take. These tests can determine whether or not a student has retained lessons taught and can determine if an underperforming educator should be dismissed from their position. To provide a continuous learning experience, students need to have teachers that enter the classroom with knowledge of the subject matter and the district's curriculum (Benson, 2010). It has been found that districts that have less qualified substitute teachers have been shown to have lower test scores and lower academic achievements. Substitute teachers should be used to the best of their abilities, and not used simply as babysitters. They are an interdisciplinary resource that has much to offer.

Due to changes in the Federal laws for certified contracted teachers, there will be a need for more substitute teachers. The law is Family and Medical Leave Act (FMLA) that gives teachers the ability to take up to twelve weeks off, without pay, because of a baby birth, a family health condition, an adoption, or employee's health. The majority of school districts guarantee their contracted teachers 10 days off a year for personal leave and professional enrichment with pay. As I began this study, I was trying to find articles on how to become a substitute teacher. I then studied what it takes to make a good substitute teacher. Finally, I looked at how different districts have used substitute teachers while making them effective replacements for contracted teachers (Wyld, 1995).

Science and math are some of the most difficult classes for which a competent substitute teacher can be found. I was told by some science and math teacher friends unless it is an emergency, they do not take sick leave because it is too much trouble.

These teachers, to whom I spoke, are part of Virginia's Fairfax County School District, believe it is way too much work to have a substitute come in and try to teach their class. I personally understand where they are coming from, but emergencies and mandatory administration days do occur where a substitute needs to step into the class. In the United States, on a daily basis, there are 274,000 classrooms that are being covered by a substitute teacher. Substitutes are required for 5-6% of a contracted teacher's class days. This means that substitutes cover 10 days out of the contracted teachers' school year (Freedman, 2010). This also means that each student throughout their schooling career will have a substitute teacher for an accumulated school year (Elizabeth, 2001). I found there are so many misconceptions about substitute teachers; that they are babysitters, are careless, or second best (Elizabeth, 2001). In general all of the people who want to be or who are substitute teachers use the position as a stepping stone into a teaching career. There are always exceptions to the rule. For the most part substitute teachers do their best with what they are given, which sometimes is not much.

As the need for substitute teacher increases, required qualifications have decreased – just to get more teachers into the classrooms (Miller, 2007).

To ensure that a substitute teacher is contributing to a normal classroom environment when the contracted teacher is absent, there are eight elements that will help: proper discipline, detailed classroom plans and procedures, thorough knowledge of the program, recognized learner differences, proper organizing and managing learning experiences, a proper professional role, and good knowledge of school rules and regulations.

Substitute teachers have been categorized by Lisa Weems from Miami University into three types: (1) incompetent and unqualified, (2) deviant outsider, and (3) guerilla superhero. A teacher's function has been looked at with regards to the shortage of teachers, educational reform, and school practices. The research was done in response to the salary disputes that were occurring in Wellston Ohio in the late 90's (Weems, 2003). The incompetent, unqualified teachers are referred to as glorified babysitters. Deviant outsiders are substitutes that "regular" teachers and even administrators respect. From the stand point of regular teachers and the administration, substitutes are considered deviant outsiders because they aren't within the framework of the contracted teachers or they are thought to be beneath the contracted teacher. The last groups are the guerilla super heroes. These teachers are shown to be very extraordinary, they are able to touch students in a way no one else could. I wanted to show there are many different perspectives about substitute teachers from different groups of people.

There have been studies that have shown a teacher's absences can affect a student's test scores (Miller, 2007). Some studies show that students learn better in some classes than others. The explanation for this is probably that some teachers are more effective than others. As most of you know, good substitutes are very difficult to find, especially in urban districts. There is a growing shortage of substitute teachers; one of the principle reasons is low pay. On average, a substitute teacher gets paid \$60 a day, but they could be employed in better paying and safer jobs. Substitute teachers, just like contracted ones have to worry about the behavior of the students that they teach. Today's students live in a culture of chaos. Students are more verbally and physically defiant of authority and even girls are loud and crude in their behavior. If there are discipline issues

within the classroom then there is diverted attention from what the students need to be learning. When substitutes enter classrooms, the instructional intensity is radically reduced, skill level is lowered, and a disruption of regular routines and procedures occurs. Students and regular teachers gain mutual trust, which is lost when a substitute is used. When a substitute enters there is a lack of trust and learning is impeded. Also substitutes do not know the students as well as do the regular teachers, so they do not know what learning tools work for the different students (Weems, 2003).

There needs to be a development of programs that can help make substitute teachers more effective. Substitutes need to have some training to become effective. They do not just innately have “the know”, of how to do the best job possible. “The components in this development program offer a means for improvement and reinforce the idea that substitute teachers are hired to teach, not babysit” (Tracy, 1988, p. 88). There are eight elements used in analysis of substitute teacher effectiveness; classroom discipline plans, procedures, knowledge of the programs, learner differences, organizing, managing learning experiences, professional role, and school rules and regulations (Deay, 1986). Other things that might help substitute teachers are school rules focusing on their needs, pointing out where things are located in the school, which is available to help the substitute, details of the schedule, and an introduction to the department leader. Serious substitutes would like to hear some feedback from the teachers for whom they had been substituting; without that feedback they have difficulty improving their performance (Deay, 1986). If substitute teachers have quality training and access to help, there will be a benefit to all those involved - especially the students. There are many ways to improve substitutes, but there is no real cost-effective way. If we want substitutes to become more

knowledgeable we need to educate them. We can also try to make it profitable for retired teachers to come back and share their knowledge. If we are not able to find a remedy our students will not be able to get a well-rounded education.

There needs to be a different attitude towards substitute teachers. They are often viewed as second best. Substitute teachers are commonly rated lower than student teachers and the contract teachers. Attitudes towards substitutes must change from the top - the administrators, regular teachers, and students all must change. Each of those groups has different expectations for the substitute teachers. Since substitutes are viewed as second best that view needs to change, substitutes need to be portrayed as an alternative and not as second best. Substitutes need to also step up to the plate and be willing to actually teach and not just look at being in the classroom as babysitting (Augustin, 1987).

One of the most interesting things I had found on being an effective substitute was a journal paper talking about that exact topic about being an effective substitute, “Substitute teaching can be greatly improved by substitutes diligently following a well-articulated and sequential method for effective substitute teaching, while remaining flexible enough to effectively teach the teacher’s lesson plan during any classroom situation that may occur”(Byer, 2008, p. 18).

## METHODOLOGY

### Research Design

Unless you have been or currently are a substitute teacher, stepping into a foreign environment day in and out, you do not have any idea how difficult a classroom can be. Is there an actual way in which a substitute teacher is effective? I guess it depends upon who is judging the effectiveness: students or contracted teachers. Let's start with a description that tells the reader the challenges a substitute teacher faces. On any given day I was called in to teach a class with entirely different students. The grades were different, the students were different, and the subjects were different. I was only collecting data from the math and science classes in which I had substituted. Substitute teaching is a spur of the moment teaching job, since you never know when you will be called in. There were certain days in which I knew for a fact that I would have to be in a classroom, but others when I found out I would be teaching 45 minutes before I needed to be there. With the job being so unpredictable, I set up a lesson plan for the students. However, if the regular teacher has planned a learning section for me to cover, I taught from the plans they have left for me.

Since in my substitute teaching, I have very limited or no contact with the students' regular teacher, I emailed the teacher a survey for them to fill out (Appendix A). I wanted to find out what the teachers thought about having a substitute teacher in their classroom. Is a good substitute all about good behavior or are the students actually learning something from the teacher sitting in? Is the only thing the contract teacher wants is for a substitute to cover the provided lesson plan? I really believe knowing what

the teachers expect and want will make me a much better substitute teacher and a great teacher in the end.

The amount of days in which I was in a specific classroom would determine whether or not I was able to perform the lesson I had developed or just what the teacher had put down on paper for me to do. When there were specific topics the teacher would like me to teach, then that is what I taught. On the days I taught a science class and there was extra time I included a safety lesson. During my study the safety lesson was given to five classes during one day. If I was in a classroom for more than a day I would have another way to collect some data.

At the beginning of each of the math and science classes I substitute taught, I had the students complete a short survey to get their feeling about having a substitute teacher. Students have very strong ideas about what they expect from a substitute teacher, whether it is discipline or them learning something new (Appendix B). Since occasionally I had very little time in the class, I conducted verbal polling of some questions that are related to substitute teaching. I polled the students when I didn't have enough time to give the students the questionnaire (Appendix C).

The following are the techniques that I used to collect data for my Action Research project. The data sources that I used are linked to the question and sub questions of my Action Research.

Table 1  
*Triangulation Matrix*

Research Questions	Data Source		
How can a substitute teacher enter a math or science class and be an effective teacher?	Student questionnaire	Polling	Quizzes/video interpretation
What might be some techniques I could implement to gain students' respect in a math or science classroom as a substitute teacher?	Student questionnaire	Teacher questionnaire	Polling
Is the teacher's knowledge of science or math linked to the students' behavior and attitudes in the class?	Teacher journal	Safety Lesson Plans	
Does the length of time a substitute is in the classroom affect the attitudes towards the teacher?	Teacher journal	Teaching lessons in math class for a week	

The instruments that I used to find out the effectiveness about being a math or science substitute teacher are as follows: student questionnaire, polling, teacher questionnaire, teacher journal, safety lesson, math lesson, post safety quiz, and video interpretation. The instruments such as, student and teacher questionnaire, polling, and a teacher journal gave me a starting point of what students and teachers think of substitute teachers in their field of study. There are several different view points for substitute

teachers; student perceptions, teacher perceptions, and administrative perceptions. The two perceptions that I focused on were student perceptions and teacher perceptions.

The student questionnaires were given to the students in the classes that I was there for a week and also the students that had very little work to do in the class. Some classes didn't receive the questionnaire, but I was able to collect some responses in different ways.

The teacher journal was more to get my own perception on how the students interact with me and treat me without the presence of their contracted teacher. I also gave myself feedback on my thoughts throughout the classes. Each time that I entered a science or math classroom to substitute teach I asked myself:

1. Did the students take their seats and quiet down in a timely manner?
2. Did the students seem to understand what I was trying to convey to them?  
How did I know this?
3. How do I believe I performed as a teacher in the class?

The lessons were a way for me to interact with the students. This helped me also see what the students knew or didn't know. I was able to see if I could implement a different way of teaching to ensure the students knowledge of the specific topics. With the lessons I had quizzes to see each students understanding of the lectured topics. The other way I was able to see if the students understood my lecture was to have them watch a YouTube video on the safety procedures I just taught, and then give me what was being done wrong in the video.

From these data collecting instruments I was able to collect both qualitative and quantitative data. The qualitative data collecting tools gave me insight of what possible patterns or trends the students or teachers lean to with their thoughts on substitute teachers. Some quantitative data will show my actual effectiveness of teaching.

The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for working with human subjects was maintained.

### Demographics

I collected data from Oakton High School and Thoreau Middle School within the Fairfax County Public School, in Northern Virginia district. The classes in which I substituted for at Oakton High School were two AP physics classes and three general physics classes; I was in these classes for six days. I saw the students from each class three times since their class schedule is in a block setting. The students were junior and seniors in school. At Thoreau Middle school I taught 15 8<sup>th</sup> grade physical science throughout the spring semester; I also taught three 7<sup>th</sup> grade math classes and two team taught 7<sup>th</sup> grade math classes for a week. I also collected data from eight classes at Flint Hill School which is a private school in Oakton, Virginia. At the private school I taught three Geometry classes and four Algebra II classes throughout the entire school year. I was in these classes for one week plus another two days in the spring semester. I was in the Geometry class for six lessons and Algebra II classes eight lessons. The students ranged from 9<sup>th</sup> grade to 11<sup>th</sup> grade.

When I finished a substitute teaching assignment in the classroom I recorded in a journal how the students reacted to my presence in the classroom (as a substitute teacher)

at the beginning and at the end, how they responded to my knowledge of science or math, and how being organized or being disorganized helped the class flow smoothly. I believe that the majority of students want to be productive within class, but are very easily distracted.

Table 2 and Table 3 present the background demographics for Thoreau Middle School.

Table 2  
*Ethnicity of the Students at Thoreau Middle School*

Ethnicity	2009-2010	
	# of Students	
Asian or Pacific Islander	101	
Black (Not of Hispanic Origin)	14	
Hispanic	51	
White (Not of Hispanic Origin)	593	
Other	50	

Table 3  
*Free and Reduced Lunches at Thoreau Middle School*

Free/Reduced Lunches	2009-2010	
	#	%
Yes	67	8.28
No	742	91.72

The demographics of Oakton High School are shown in Table 4 and Table 5.

Table 4  
*The Ethnicity of the Students at Oakton High School*

Ethnicity	2009-2010	
	# of Students	
Asian or Pacific Islander	492	
Black (Not of Hispanic Origin)	106	
Hispanic	168	
White (Not of Hispanic Origin)	1448	
Other	117	

Table 5  
*Free and Reduced Lunches at Oakton High School*

Free/Reduced Lunches	2009-2010	
	#	%
Yes	217	9.31
No	2114	90.69

Tables 2-5 the students from both Thoreau Middle School and Oakton High School show the students of these schools are well off and have a good mixture of ethnicity for their students.

Flint Hill School is a private school, so the majority of the students pay to attend. I was only able to find the number of students at each level of the school. They did not go into the ethnic background of their students. Also there is no reference to any free or

reduced lunches at this school. This is because it is a private school and even if a student is on scholarship they still get lunches provided.

Table 6  
*Enrollment Numbers at Flint Hill School*

Flint Hill School (Total Enrollment=1110)	
Lower School (JK-Grade 4)	306
Middle School (Grades 5-8)	319
Upper School (Grades 9-12)	485

### Treatment

It tends to be difficult to plan a lesson for me as a substitute teacher. I was never sure what the students were learning before I entered the class. The one lesson that I prepared was a safety lesson that I asked my friend if I could just enter her class and give a brief lesson on safety. The other lessons were prepared by the teacher since she was going to be away for a week. The lessons covered solving inequalities, abnormal inequalities, and graphing inequalities.

I have a strong belief in safety lessons, so it is one of the most important parts of the science class. Safety needs to be addressed at the beginning of semester and the students need to be reminded at the beginning of each new lab that the students conduct. The students need to know the specific types of hazards they might come across in the lab and how to deal with each of the hazards should they arise. On one substitute teaching assignment I was able to teach a lesson on laboratory safety. Before I gave the lecture on laboratory safety I had the students write a minute paper to see what safety hazards they felt were present in the classroom. I additionally asked them what they knew about

safety in general. This allowed me to see what the students knew about safety in the laboratory and what hazards existed there.

The safety lecture included details about the different types of hazards that are in science classrooms; such as, chemicals, fire, water, etc. Accompanying the approximately 15 minute lecture was a handout about the contract I enter with my students in Microbiology (Appendix D).

I showed the students some labs that I had for my Microbiology class. I went through some of the examples of safety in the labs from the Microbiology class. We also went over some labs that they performed during this school year. After the lecture and overview of the labs I had the class take a five question quiz that covers some basic elements of laboratory safety (Appendix F). After the lecture I showed the students a YouTube video showing a laboratory arrangement (Appendix G). I made each student write down some of the bad laboratory practices used by the scientists in the video. The entire lab safety was covered in a 48 minute period of time during five class periods.

The following treatment plan was set up for me by the contracted teacher I was substituting for. I stepped into a small group math class for a week and taught the students about inequalities. There weren't more than 10 students in a class. During the same time I was team teaching with another teacher. The students from the team teaching class were taught inequalities by the other teacher as I helped keep the room under control. One of the differences in the classes was that the small group class contained many students that had either learning disabilities (LD) or emotional disabilities(ED) that required the students to be placed in a small group setting. The larger class that was being taught by the other teacher had regular learning students plus

students that were LD and ED, but could function in the bigger group setting. Both classes each day had homework assignments to complete. For both of the classes I ensured that the students had their homework checked each day. I documented the completion of the homework onto the required sheet left by the contracted teacher. At the end of the week both of the classes also took an inequality quiz. The students from the larger class that had LD's and ED's I pulled aside to a smaller quieter classroom for them to take their quiz. Unfortunately these groups of students had a larger amount of variables in play. During the week's lesson of solving inequalities I covered the basics of solving inequalities by going through the notes that the teacher had given me. After completing the notes I had the students practice these on the board. The next two days I continued with the same procedure each day I was in class. The next day I made sure the students completed their homework from the night before and checked to see if they were correct. After checking I gave the lesson of graphing inequalities and also had them perform some practice problems on the board. Just like the previous day I made sure the students completed their homework and checked it, and I covered the final lesson which covered the irregularities of inequalities. The Thursday of the week I had substituted was a review day, we went through review worksheets to ensure me that the students knew the material. On Friday was the day to test the students on what I had lectured. I allowed the students to take the entire time to finish the quiz. All of these lesson plans and activities were given to me from the teacher that I was substituting.

I collected the data from a week of teaching Algebra II and Geometry at Flint Hill School, also another three classes, two of Algebra II and one Geometry class at Flint Hill School, a 7<sup>th</sup> grade math class for a week at Thoreau Middle School, a week teaching AP

Physics and General Physics at Oakton High School, and 8<sup>th</sup> grade Physical Science classes at Thoreau Middle School. This makes for a total of twenty-one lessons throughout this academic year.

## DATA AND ANALYSIS

### Student questionnaire

I started several of the classes with the questionnaire/survey (Appendix C). I was able to show the results with the Yes and No answers. This was the beginning of my data collection process, so I actually was able to evolve my questions and the form of my questions. I was trying to work out how and when I was able to have the students freely answer questions. When I entered the classroom as a substitute teacher for a high school math class, I wanted to know how the students reacted to me being there. My main focus was to see what the students believed to be a beneficial way for me as a substitute to enter the science or math class. I gave the students a survey for them to answer during their class. The survey was given to all four math classes that I was substituting for at Flint Hill School, two Algebra II/Trig for juniors, sophomores, freshman and three Geometry classes which were freshman and sophomores. I gave the students five minutes in which to complete the survey. I reminded the students that it wasn't directed at me personally, but substitute teachers in general.

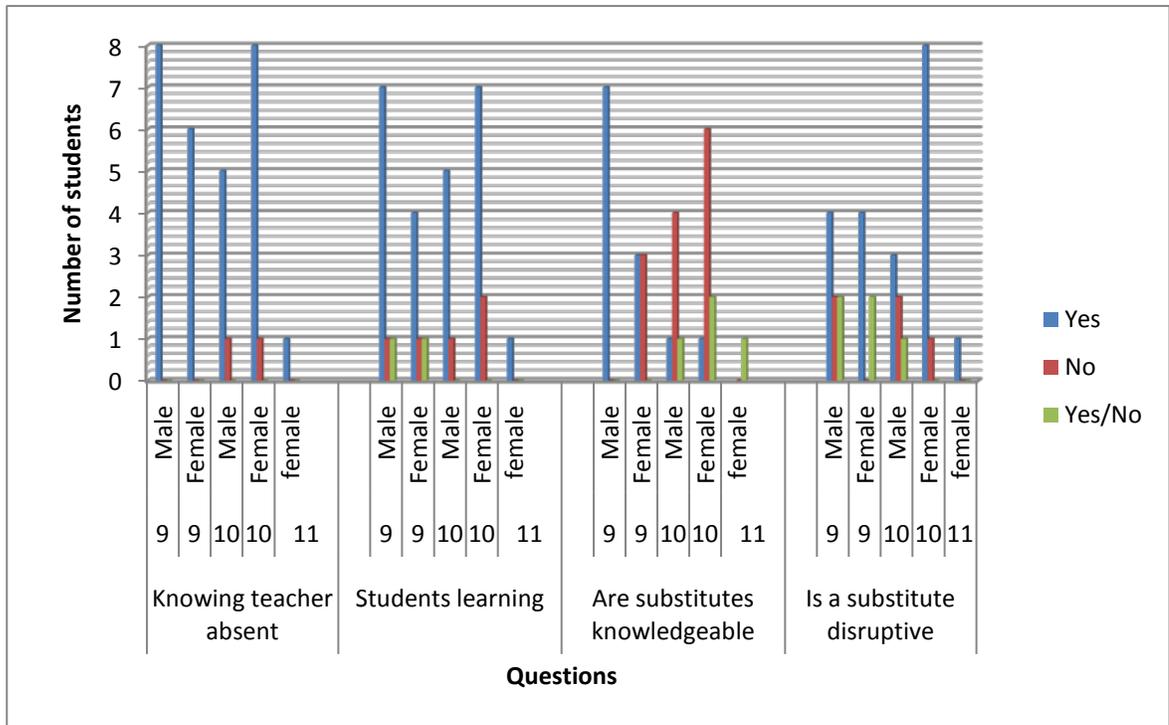


Figure 1: *Students Feelings on Substitute Teachers, (N=30)*

The purpose of question one was to measure student's reactions to substitutes when they knew their contract teacher was going to be absent versus when they were surprised by the appearance of a substitute. The majority of the students knew their teacher was going to be out, but as they are teenagers, several couldn't remember. In this one situation of me being a substitute teacher for these math students, I knew a month in advance that I would be substituting for a week, so it was very hard for me to believe that their contract teacher didn't tell their students of their planned absence. As we know, students seem to hear what they want to hear. As determined by question two, the majority of the students (78%) stated that they truly believed they would be learning something new during my week substituting for their math teacher. Of course, there were some students who believed they do not learn anything in school. Question two was

asked to determine whether or not the students believed substitutes had the same subject matter knowledge as their contracted teachers. From the data the younger the student the more faith they had in their substitute having knowledge about the subject they were teaching. As the students got older they started not believing the substitutes could actually cover and teach the topics. Question four was asked to determine if students felt that having a substitute was disruptive to the learning process. The tenth grade female students (89%) believed it to be a big distraction to have a substitute teacher. The students from the other grades also believed substitutes were a distraction, but not to the extent the females from the 10<sup>th</sup> grade ( $N=9$ ). I believe at this age female students are pretty serious about their studies; also anything out of routine tends to disrupt any student, but it seems to me that females seem to be much more easily distracted by outside interferences. Only ten students out of thirty believed having a substitute teacher wasn't a disruption or it didn't bother them, so in total 33% of all the students I questioned believed having a substitute teacher was a disruption. I found that students really do have strong opinions on what they think of substitute teachers.

I also had students answer a questionnaire to get feedback on their thinking about substitutes. These questionnaires were initiated after I saw I needed more information from the students. The questions asked are attached as Appendix B. These questions required more than a yes or no response, as I didn't get a lot of information from previous questions. The students to which I gave the questionnaires were Geometry, Algebra II, General Physics ( $N=78$ ), and AP Physics students ( $N=53$ ). The students in the Physics classes were from Oakton High School and the math students were from Flint Hill School. In looking at the students responses I found the older the students the more they

wanted to learn and not to just waste time. The older students didn't just look at the faults of the substitutes and actually looked within themselves and other students. The students in AP Physics ( $N=78$ ) are students that tend to be very serious about their education than those students in the General Physics classes ( $N=53$ ). With regards to the math classes, unless you are in the honors or AP equivalent the math classes are just a mandatory subject for the students to take.

The following summarizes student responses:

Question One: What is your overall impression of substitute teachers, based on previous experiences?

The majority of the Physics students believed substitutes are nice, fun, usually do a good job, are less strict, and don't do much. There were some other students that like substitutes as long as they aren't teaching anything or they know what they are doing. Some of the other negative comments were substitutes are terrible, some are disrespectful to the students, they don't know the material, boorish, and tend not to know what they are doing. An 11<sup>th</sup> grade male student said, "Substitutes usually do a pretty good job, it is difficult to come in the class and try and teach a lesson." Also an 11<sup>th</sup> grade female had the following to say, "They're very good because they usually have no knowledge of the subject and try to teach it, but just get the students more confused. If no teaching is involved substitute teachers are pretty good though."

Within the Algebra II ( $N=46$ ) classes the 10<sup>th</sup> and 11<sup>th</sup> grade students believed substitute teachers were nice, liked them, easier, more relaxed in class, and very patient. There were also some negative responses, such as: they also don't know what they are doing, lazy, rude, controlling, they don't really feel like a "teacher", are overly strict and

some are mean and harsh. A male in the class said, “They do their best, but sometimes have difficulty answering questions.” An 11<sup>th</sup> grade female student was quoted as saying, “They are usually easier than the normal teachers, and if not easier, a bit mean and harsh.” Another student believed, “The class usually changes from its original subject to a study hall period when there is a substitute teacher.”

The geometry students ( $N=43$ ) were much younger. They were 9<sup>th</sup> and 10<sup>th</sup> graders. Those students had no negative things to say about their substitute teachers. A 9<sup>th</sup> grade male student said, “laid back, followed instructions exactly, sometimes gullible and others not at all.”

Question Two: What expectations do you have in a class with a substitute teacher?

Almost all of the students in the three different classes gave responses that were alike, the day would be very laid back and they wouldn't do too much. They expected to do less work in class, treat the class like a study hall, work on homework, and learn something less than normal. Some did say they would be doing work their teacher had left for them. Only a couple gave some constructive information of their expectations, they expected their substitute teacher to actually know the topic they were teaching and to review material that had previously been presented. A female 12<sup>th</sup> grade student said, “I expect they take attendance and leave the students to work by themselves.” Another female student in 11<sup>th</sup> grade wrote the following, “I expect that the class will be easy that day and things on the normal agenda will most likely not get done.”

A female student in one of the Algebra II classes said, “That they have at least a general idea of the subject they are substituting for and not just there to baby sit the

students while the teacher is away.” An 11<sup>th</sup> grade female believed the class was to, “review something we went over in class, do what the regular teacher assigned or to do nothing and have a study hall.” Most of the students want to be productive in class, so this is why we need to have time in the class being used wisely.

Question Three: What do you find to be most disruptive in having a substitute teacher?

The students in the Physics classes were a mix of students who were routinely disruptive - just having a different teacher was additionally disruptive. The principle disruptive element of having a substitute was the substitute not knowing the subject matter coupled with the substitute and teacher having poor communication of what was needed to be done in the class. An 11<sup>th</sup> grade student believed, “A sub that has no clue what they’re talking about.” Another student in the 12<sup>th</sup> grade said, “Completely veering away from the teachers instructions and perhaps bringing movies, games, etc when they are not suppose to.” Another quote I thought was interesting is as follows, “The regular flow of the class is not present and it is hard to keep pace with the regular schedule.”

For the Algebra II classes, the students pointed out disruptive behaviors such as: other students who were too talkative, rude, too loud, and simply behaving in a disrespectful manner. Some of the other disruptions pointed out were: substitutes not being able to interact with the students, classes being put off their regular schedules, poor explanation of work in class by the substitutes. An 11<sup>th</sup> grade female student in the class wrote, “When the absent teacher assigns tedious work to do in class.” A 10<sup>th</sup> grade male student said, “People start to take advantage and start being loud” tends to be the disruptive part of class.

The Geometry class students said many of the same things as did the other classes, pointing out these additional disruptions; lack of focus in the class, substitute teacher enforcement of studying, and changes in teaching styles. One of the females thinks “The fact that they usually don’t know exactly where our class is about and how they often change the standard teaching methods” and another female students thinks, “When the teacher doesn’t understand the instructions given to them.”

Question Four: What would be most valuable for you during a class with a substitute teacher?

Some students stated that the thing that would be most valuable would be to have free time or a study hall. One female student in Physics believed, “it would be valuable to have a substitute teacher with subject matter teaching experience and that was able to explain the subject material.” A male in the 11<sup>th</sup> grade said, “For them to review previous material (not learning anything new) so the students don’t need to ask for a lot of help.” Another student said, “If they explained things because sometimes the teacher isn’t always clear and it might help if someone else showed a different method or something.”

In math classes, the responses were different. The students wanted to keep up with the lesson at the same pace that would be used by their normal teacher. They indicated a desire to learn from a teacher with a different teaching style. They wanted to be able to listen quietly. They found that the substitute teacher could actually help solve problems. They did not want to have an English teacher teach chemistry or Spanish teachers teach biology. One of the main things a female student believes would be valuable in the class was, “Being able for the teacher to keep the same pace as the normal

teacher goes when teaching.” Another female from one of the Geometry classes felt, “the teacher teaches different so you get to learn from a different style.” Of course you will always have the students that don’t want to do a darn thing in class. Some other statements are “To review something we learned”, “Social time”, “free time”, and “to just review”. The male students tend to have a different view, so here are a few comments “having someone who knows the material”, “when a teacher helps me solve problems,” and “Catching up on work that you’ve missed and doing other homework.”

The differences in the responses to the last question between the different subjects could be due to the school in which I collected the data. The math students and the Physics students were from Flint Hill School and Oakton High School which is part of Fairfax County Public School District. Flint Hill School is a college prep school, so the students tend to be a more focused group when it comes to their studies. Also these students have a lot of pressure to perform and behave a certain way in school. Oakton High Schools Physics classes are chosen by the students to take, so most of those students are in there because they want to be. They can be classified as serious students.

After listening to what the students liked or disliked about having a substitute; I focused on my perception of how the students perceived a substitute teacher. I documented each of my experiences in the math or science classroom on a daily basis. I focused on the students’ behavior and their interaction with me. The way I kept track of my thoughts of the daily substituting I did and the student behaviors were by writing in a journal. I had so many substituting jobs that I wouldn’t have been able to decipher one class from another. I have also been answering set questions that are in relation to the class in which I am substituting. The journal includes my thoughts on how the students

acted, and how I perceived their learning while I was in class with them. Three questions were:

Question One: Did the students take their seats and quiet down in a timely manner?

I have to say the quieting down period decreases with the age of the students. The middle school students would try to get away with not sitting in their assigned seats. So it took awhile to get them seated and settled down. The 7<sup>th</sup> grade students were far worse than the 8<sup>th</sup> grade students. The middle school science classes had a routine in the way they started their classes. As the students entered the class they had a warm-up drill to complete. The students wrote down definitions of what they were covering in a unit and then a question that they needed to answer. The math classes also had a warm-up, which included 3-5 problems from the unit they worked on. At the high school level I didn't have to wait for them to quiet down, but they seemed to wait on me to tell them what they needed to do in the class. These students knew what needed to be completed, so they usually got right to work. Of course they would chat for a while before the bell rang, but they would settle down once the bell sounded.

Question Two: Did the students seem to understand what I was trying to convey to them? How did I know this?

To be honest when I was substituting at the Oakton High school Physics class, the teacher left worksheets for the students to complete, so there was no teaching involved. Occasionally the students had questions, I tried my best to answer, but some of the time I asked for the other students to step up and help their fellow students. However, physics isn't one of my strong subjects, so I felt inadequate in responding to their questions.

While substituting at Thoreau Middle School for math I actually was able to teach the students. When I substitute taught in 7<sup>th</sup> grade math for a week, the class was covering solving inequalities. Each day I had a different topic to cover in solving inequalities. For example: Monday covered what inequalities were, Tuesday went over graphing, Wednesday addressed what happens when you have to divide by a negative in solving the inequality, Thursday we reviewed all they had learned earlier in the week, and finally on Friday they took a quiz. In this class I had a pretty hard time because it was small group class with students who had learning disabilities and some discipline issues. Their attention spans were short and they were easily distracted. When I reviewed quiz answers others would just be a little disruptive. There was a female student who kept saying, "I don't understand, I don't understand." I asked what she didn't understand and she kept saying, "All of it." After having her calm down and work on several problems, she actually started to understand and completed problems on her own.

I was able to help students in Geometry and Algebra II at the high school level. I didn't have a lecture to give them, but while they were doing work on the board and at their seats I was able to jump in and tell them what they were doing right or wrong. I didn't have a measure of my teaching effectiveness since they didn't have a quiz/test until after I was gone. With one of the classes I recorded, "The students just don't want to do as I instructed and I need to become more assertive with making students respect me and complete their assignments that need to be done." The teacher had left a recorded lecture for me to play for them, so they wouldn't fall behind in their lessons. Another time I substituted for Geometry and Algebra II, their assignment for class was to do their

homework problems on the board. I was able to help the students that did not know what they had done wrong with the problems they were assigned.

For the next question I will discuss the different classes' behavior during the months that I substituted.

Question Three: How do I believe I did in the class?

October - I was in the class for 5 days. The teacher actually left recorded lectures for me to play for the kids. I was able to help by having them do problems on the board and correct them if needed. As far as the student behavior, I found most of the students were respectful and completed their work. Of course there is always one class that enjoyed pushing the envelope and was very chatty, but I felt I did well for the week.

December-I was pretty much a monitor since they had independent work to do for the six days I was there. The timing of this substitute job was a little difficult because it was a week before winter break and the students didn't want to get a whole lot done. I don't think my time was well utilized; however Physics is not my cup of tea so I am glad I didn't have to do too much. I didn't feel I did a very good job in the class. I felt I was just there to be a babysitter, but I guess that is the job sometimes. One of the things I feel I could have done is to actually study ahead of time for the Physics topics that the students covered. Also once the students had finished their worksheet packet, I could have created a fun lesson for us to go over so they were actually doing something productive.

February-I substituted two days for an 8<sup>th</sup> grade physical science class. The classes were preparing for their state test which was in May. They had a full workbook to complete before the test. The unit that I was there to cover was the different

ecosystems on the planet. I was able to answer almost all of the questions off the top of my head or with very little. The students hadn't seen most of the topics since they were in 7<sup>th</sup> grade, so they needed a lot of refreshing. The students complained about having to do work, but I believe in the end they were happy that I was able to help them answer some of their questions.

March-I lectured to the students about solving inequalities. Each day I checked homework and found at least 3 students that didn't complete their work. I didn't and don't know how to get the students to believe that it is important to do their math homework. There was one student that I believed I reached; at the beginning she was being very stubborn and just said she couldn't do her work. By Thursday I was able to sit her down and do the work and she could explain it to me. I felt that to be a huge accomplishment for both of us. When Friday came, it was the day of reckoning. They had a quiz to see how well I taught them and how well they understood what I was telling them.

Within the following section there are polling questions that I asked the students to fill out the student questionnaires. The below pie charts display how the students felt about having substitute teachers. There were five questions that had the students raise their hands to tell me if they strongly agree, agree, no difference, disagree, or strongly disagree. The students that were polled ranged from 7<sup>th</sup> grade to 11<sup>th</sup> grade. The subjects that I asked these questions in were math and science classes.

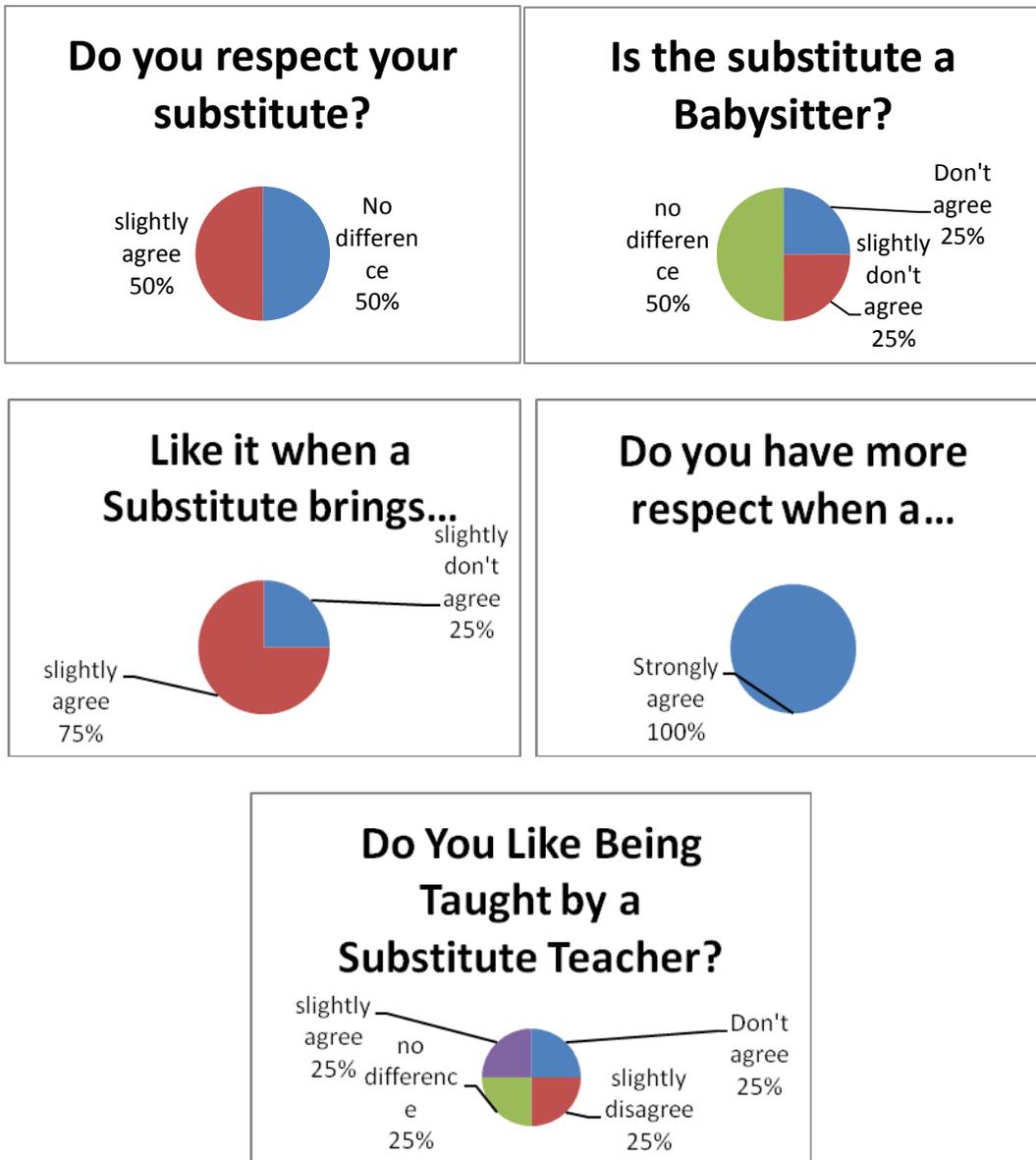


Figure 2a-e. *Polling the Students, (N=174)*

This demonstrates that students actually like and respect substitute teachers that have knowledge of the subject they are teaching. It was gratifying to see that all of the 200 students that I polled do not believe a substitute teacher is a babysitter. It was also nice to see the more knowledge a substitute teacher brings about the subject they are teaching the more respect they have for the substitute teacher. The students seem to have

a general respect for any substitute that enters the classroom. Also if you are an exciting substitute that can teach the students something, the students have a much better respect for the substitute. There was very little enthusiasm to the students' responses to the questions. I believe it does show some basic understanding of the students' feelings towards substitute teachers. This type of data collection I believe gave some false assumptions to what the students are feeling.

While looking at the questions and the responses to the corresponding classes plus my journal entries, I found that one of the Algebra II classes which were disrespectful and chatty actually gave all positives responses about their substitutes. Also when I substituted another day for them they responded, "They respected substitutes when they bring something new to the class, they also liked being taught by substitute teachers, and finally they didn't see a substitute teacher as a babysitter." This could be the students like being disruptive and none of their substitutes put them in their place. I personally believe students need to be able to communicate with the other students in the class, but sometimes that can get out of hand and trying to reestablish class management is difficult.

I was very amazed to see more of the male students had a greater respect of substitute teachers, but this was pretty much set in the high school age students. They also put a lot of the blame on themselves or other students for the disruption of the class, instead of just blaming the substitute.

### Teacher Questionnaire

I looked at five teachers that I had substituted for in the past year. Three of them were middle school teachers and two were high school teachers. I gave the questionnaire

out to several other teachers as well, but was not able to get them to respond. I had the teachers reply to the questions found in the Appendix A.

Question: What do you want a substitute teacher to accomplish during his/her time in class?

The main things the contracted teachers wanted the substitute teacher to accomplish are collecting and passing out papers. They also wanted the students to be monitored. One teacher said, “The substitute needs to follow the plans and have the students complete their assignments.”

Another contract teacher said, “The substitute to continue the lessons and activities.”

Question: Do you expect your substitute teacher to carry out your lessons for your math class to the “T?”

The teachers I had given the questions to, had split answers, 3 out of the 5 said they didn’t have to carry out the lesson to a “T”, but the other 2 believed they needed to be followed precisely. One of the contracted teachers said, “A substitute should follow the lesson, but it’s alright if they want to be creative.” The same teacher also commented, “The teacher tries to leave plans with a test or quiet student work, but when they are out for a few days she makes sure she knows who is substituting and gives them lesson plans so they don’t miss any instructional time. The substitute is expected to deliver lessons to the “maximum extent” that the substitute can.”

Do you believe the lesson plans that you give a substitute teacher is enough information to teach the math or science class as you would? Give some examples of how it could be improved.

One of the teachers from the private high school would always leave recorded lectures when she left for more than one day. There also was another teacher who believed, “all substitutes were certified teachers, so the substitute should be able to utilize lesson plans.” Another teacher didn’t believe, “they could give enough information in lesson plans if the substitute was not well founded in the class subject matter.”

Question: In the past have you had a difficult time finding an adequate substitute teacher to actually teach your students math? Why could this be?

Three out of the five teachers questioned believed the school district in which they taught didn’t have adequate substitute teachers. The other two are part of Fairfax County Public School District which from the teachers’ knowledge there are enough qualified substitute teachers. One of the science teachers that I gave the questions to found, “some substitute teachers wouldn’t play evolution videos or discuss anything dealing with evolution.”

Question: How effective do you want a substitute teacher to be? Give some examples of how it can be accomplished.

The contracted teachers want everything while they are gone to run as they do when they are in class. Some of the ways the teachers gave me were, “The substitute needs to get the attention of the students, maintain classroom routine, deal with students wanting to create trouble, help students that might be struggling, and teach all at the same time.”

Another teacher said, “That it is the classroom teacher’s responsibility to make those goals attainable by providing extensive plans and a substitute teacher’s effectiveness is a function of the quality of the lesson plans provided.”

Another teacher had very low expectations for their substitutes, but if they are gone for a long period of time she recognizes that papers need to be graded and lessons taught. The main thing to be effective is to have good classroom management, so lessons can be carried out. The substitute should just cover the material that is provided if the substitute has good classroom management skills this will help deter distractions and keep the students focused.

Question: How do you think students perceive a substitute teacher?

The main theme from the teachers seemed to be it would be an easy day where the students will goof off when there was a substitute. The response from the private school teacher said, "My students are respectful of their substitutes and treat them as they would any other adult." Another thought from one of the teachers was the more knowledge a teacher had for a specific subject the students would less likely take advantage of the substitute.

Question: Do you expect feedback from your substitute and what kind of details are you looking for?

All of the teachers want the feedback from their substitute teachers. For the most part the teachers just wanted to know how things went during the day. The teachers wanted to know the problem children. The private school teacher said, "Absolutely, I want to know how the lesson went and how the students did, who caused trouble, which was having difficulty, and any other details that might help me when I have a substitute again."

One of the most interesting things I found with the teachers responses was the thoughts of the private school teacher. It seemed she implied that her students were

always well behaved. I looked back at my journal notes regarding the classes I substituted for her and what I thought of their behavior. For the majority of her classes the students' behavior was great, but there was one class that had a difficult time settling down and focusing on their work that needed to be completed. This is funny since the teacher said, "My students are respectful of their substitutes." I also found as the classes became more familiar and comfortable with me sometimes the more disruptive the kids were.

#### Minute paper for Laboratory Safety

The reason I did this classroom assessment was to check and see the knowledge the students already had in regards to safety in the classroom. I wanted to enter a science class with a prepared lesson, so I ensured the students had something to learn. I also wanted to handle me entering their class as a substitute and teaching the students something useful. I used an 8<sup>th</sup> grade as my sample class ( $N=174$ ) for a safety lesson. I gave this lesson to the 8<sup>th</sup> grade class to show my impact as a substitute teacher on the students. The 8<sup>th</sup> grade curriculum covers Physical Science, which includes Chemistry, Astronomy, and Physics; I wanted to know how much information the students already had on the safety within their classroom labs. Students generally do not seem to think about safety first. The prompt I gave them to write on for a minute was "When entering your science class on a lab day, how does safety play a role?"

The students did bring to light that safety rules and regulations are used to keep them safe. There were some students that didn't understand why we needed to know about safety in science classes. Since the 8<sup>th</sup> grade class covers many different topics such as, Physics, Astronomy, and Chemistry; the students didn't see the point for safety

in Physics and Astronomy, but Chemistry they believed it was important. The students gave comments such as; “there’s nothing important safety wise in the lab, I need to know the different materials that I will be using in this laboratory class, and since I am in 8<sup>th</sup> grade science there aren’t any safety hazards that I need to know.” When it came to Chemistry the students named, “fire to be the main hazard they would come across and the chemicals themselves.” The students don’t have a reason to understand safety until it affects them personally. Maybe if they had some in your face experience with the lack of safety than they would find it more important. I think like most things, out of sight out of mind.

#### Safety quiz

I had the students take a short safety quiz after I gave them the safety lesson (Appendix E). The quiz was given to five 8th grade science classes at Thoreau Middle school. My teacher friend allowed me to enter the class and give a lecture and then conduct a safety quiz. These scores show how the students learned from my lectures. It also showed some of the knowledge the students themselves had from past lectures and their contracted teachers. The answers to the quiz is, as follows; 1. False, 2. True, 3. False, 4. False, and 5. True.

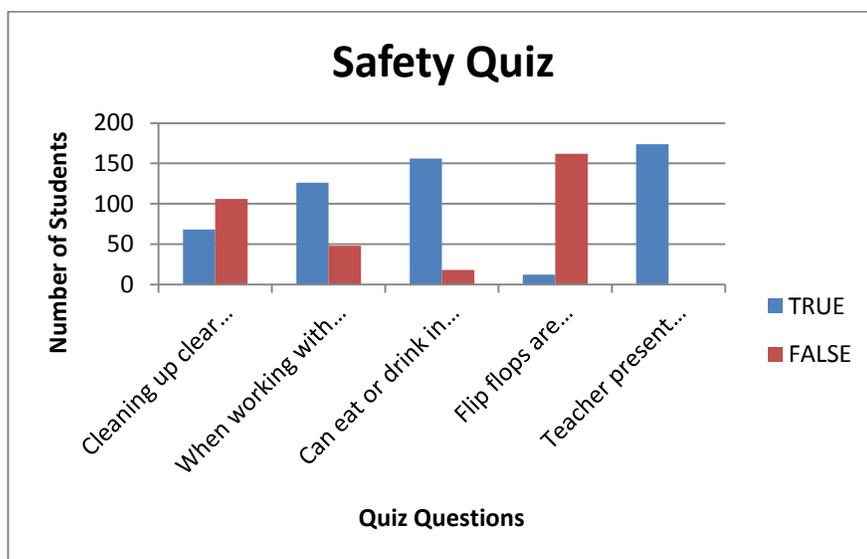


Figure 3. *Student Responses on Safety, (N=174)*

The quiz showed the students, for the most part, understood the main concepts that I wanted them to pull from the safety lecture that I gave, but the question regarding wearing goggles and eating and drinking in the lab I was hoping they would truly understand and get the answer correct which they didn't. The first question covered a clear liquid being spilled, but some of the students remembered the answer and of course the others didn't. The clear liquid could be many different things, so I do understand the difficulty in answering the question. During my lecture I talked about chemical spills and water spills from the sink. For the question asking about safety goggles, there were roughly 35% of the students who got the question wrong. The reason for this could be, the students think plain glasses are sufficient enough for them to be safe, when in actuality goggles are much safer for eye protection. It was great to see that the students needed to be supervised when conducting a lab and closed toed shoes are also mandatory. I made a big deal about the closed toed shoes because working in life sciences I had

teacher who would let their students wear flip flops while they were dissecting things in their classes which I believed was pretty unsafe.

### YouTube Video

When watching the YouTube safety video I heard a lot of giggles and sighs. Most of the students showed by body language that they understood the safety issues presented. I believed the activity to be a great activity; some of the students thought it was a big waste of time. I believed it helped reinforce the student knowledge of laboratory safety. I believe I could have done this activity as a before and after, so see what the students knew as far as safety and then to see if I taught them something new after the safety lesson. Some of the laboratory practices from the video will show what not to do. I believed this will help student retention of good laboratory safety practices.

### Homework done in 7<sup>th</sup> grade math

Each day that I substituted in the small group 7<sup>th</sup> grade math class, I had students complete homework assignments and check them the following morning. In the team taught class all of the students came into class prepared with their homework completed each day of the week. In the small group class, over half of the students hadn't completed their homework which is shown in Figure 4b. You will notice the test scores and the quiz scores have some correlation.

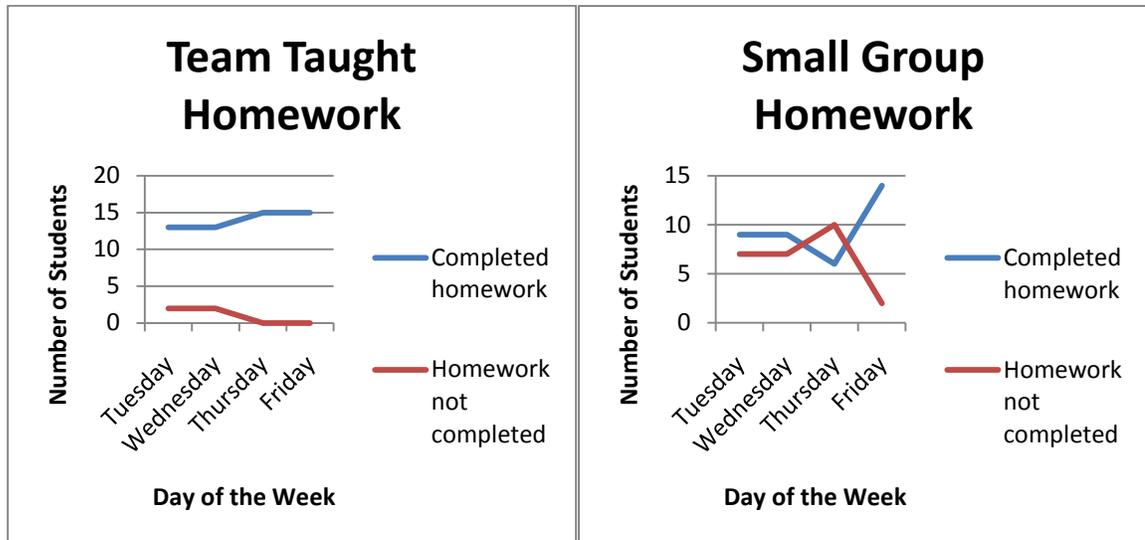


Figure 4a. *Completion of Homework in Team Taught Class, (N=15)*

Figure 4b. *Completion of Homework in Small Group Class, (N=16)*

The team taught classes, had a strong teacher present who the students were used to. The majority of the students from the team taught class completed their homework assignments on time as shown in Figure 4a. When checking the homework, I just made sure there was something written down on their worksheet. The small group math class had a more challenging time with completing their homework. The small group math class is designed for students that needed a little extra help because of learning disabilities and emotional disabilities. The students weren't very self-sufficient in their school work, they didn't want to be at school. I felt towards the end of the week the students actually believed I had their best interest at heart. Several students told me, "I want you to be our teacher, our normal teacher is so mean." It seems that I actually got to the majority of the students since they seemed to complete their homework. From teaching at the Cochise Community College and my Assistant Dean being a math teacher, I have found that the good students did their homework and the not so good students didn't do their homework.

### Quiz score for the 7<sup>th</sup> grade Math

I have quiz scores from the small group class I taught and the classes that I helped team teach. The results caused me to wonder if it could be my teaching style or just the students learning capability. As you can see within Figure 5 below the average of the quiz score for the team taught class was much higher than that of the small group math class. There could be many different reasons for the disparity in the students' grades between classes, the way the topic was taught, the students themselves, the classroom environment, and the presentation of the information. The small group classes had twelve students at most, but each of the students had either LD or ED which made teaching a little difficult. Within the team taught classes I was present just to ensure students stayed on task and the students who needed help could get it. The following are the scores from the small group classes and the team taught classes.

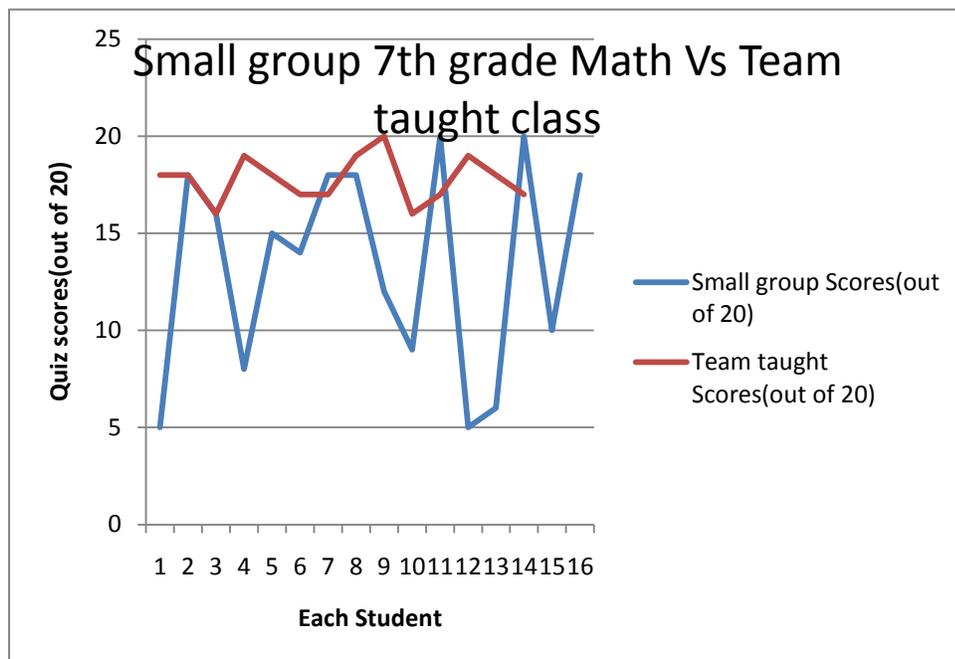


Figure 5. *The Quiz Grades on the Inequality Lesson, (N=31)*

Looking at the above data, the team taught students seemed to do much better than the students in the small group. The team teaching class had a mean score for the quiz of 18 out of 20 and the mean score for the small group class was 16 out of 20. It still leaves some unanswered questions and variables. From being in the small group class, I can say those students were very easily distracted and just didn't want to be at school. It is interesting, the more time I spent with the students with either LD or ED the more I could tell the students just seemed lost. Most of their moods were like a roller coaster, so their lack of focus is understandable. From both classes there were students that received a perfect score on the inequalities quiz. The worst grades came from the small group classes. The small group students seem to have a lot different problems trying to focus and do the work in school, especially when the students don't like math to begin with. I wasn't able to compare students' regular grades with the math quiz grades, so I wasn't able to compare and contrast the grades. I will tell you the students that are easily distracted during the normal class were still easily distracted by my lecture. I have had the opportunity to substitute the majority of the teachers in many different subjects, such as; English, PE, and Spanish. My first instinct of the students grades is that it is my fault and what did I do wrong that the students did so poorly. My next reaction tends to be what's wrong with these students; I tried everything possible to get the students to understand the topic. Personally, I need to come to some compromise to help the students that want it and try my best with the students who don't want help.

## INTERPRETATION AND CONCLUSION

My data collections techniques were very limited and weren't ideal. My data and collection tends to reflect the difficult situation that substitute teachers are faced with.

The main question I wanted to examine was how to be an effective substitute teacher. An effective teacher can be one that makes the students engaged, that disciplines and keeps the students on track or one that is there to help the students. There are several different points of view for this, the students, the contracted teacher, the substitute teacher and the administration. The students either want to learn something useful or just to have a relaxing day. This was shown to be true in the student questionnaire, my journal, and the polling questions. The contracted teaching point of view was shown by the teachers' questionnaire. For example, teachers stated, "The substitute just needs to cover the basics, collecting and passing out paper, and just keeping the class under control." From my point of view I would say that the contracted teachers don't have too much faith in substitute teachers. Also another teacher responded, "Absolutely, they should follow my lesson plans to a "T." As for the substitute teaching point of view, my personal journal gives insight plus just looking at all of the other data collecting tools gives me more facts. While looking into my journal, throughout the week of my teaching experience at Thoreau Middle School, for the 7<sup>th</sup> grade math class I noticed the same students repeatedly said I don't understand. Within the week or even though out the day in which I substituted for the 7<sup>th</sup> grade math class, the number of times I had to tell the students to be quiet increased. As the day progressed the students' behavior became worse. Towards the end of the week the students were more distracted, even with the need to complete work and a take a quiz. I felt this could be because they have gotten to know

me better and felt more comfortable with me. I didn't do any data collecting with the opinion of a good substitute in the eyes of administration, but if I were to do a similar study I would definitely include the administrations opinion of substitute teaching.

I also wanted to find ways to gain students' respect, if my knowledge of science or math had a link in classroom behavior and attitude, and finally the amount of time I spent in a classroom. I personally think to gain students respect you need to show the students some discipline, but give them a softer side also. I have students say, "Some substitutes are harsh to the point where they are disrespectful to the students." And others just say, "Substitute teachers are a push over." I found most students are at school for a reason, to learn and not to just goof around. With me coming into the classroom and actually teaching the students a specific topic keeps the students on track and focused. They are less likely to stray from the task at hand when they are being taught something. The Algebra II and Geometry classes found it interesting while they were going over their homework I was able to tell them what they were doing right and wrong with the problems. As I entered different classes to substitute teach the students became more and more familiar with me. This made keeping them on task more difficult because they knew my expectations, which were as long as they were productive and allowed me to cover what I needed to cover, I didn't mind them talking during book or packet work. A lot of the students tried more and more to push the envelope. I believe the longer you are in a classroom with the students the more comfortable they feel, but they can start being more disrespectful at the same time.

Substitute teaching is a difficult thing to do. There are certain things that will make substitute teaching easier for all. I have learned the following from the data that I

have collected: there are so many different variables that I had not thought of during my initial ideas for my capstone project. The main variables I found during my research included; the preparedness of the contracted teacher for the substitute teacher, the type of students that you would be teaching (special education students or just the regular everyday students), and the type of school that a substitute is attending for the day. My first experience as a substitute teaching was at Flint Hill School. It truly was an amazing experience; the teacher had each day spelled out for me. The section I needed to cover with lesson plans for the students, what homework they needed to complete, and when it was due. She left me specific notes about the classes in general. Most of the science and math teachers that I have substituted were ready for me to enter their class with activities for the students while they were gone. Some of the other classes I have substituted; the teachers weren't prepared and the classrooms tended to get out of control. These ideas were all expressed in my substitute teacher journal. Just looking at the quiz and homework data, they show that 7 out of the 16 students of the small group classes failed the quiz. The students not passing the quiz could be a reflection of my teaching of the information or they could just be easily distracted and don't want to learn. During the week of the lesson homework for Tuesday and Wednesday, 9 out of 16 completed it and Thursday 6 out of 16 completed the homework. Looking at those numbers doesn't give a lot of confidence in the LD or ED students to learn a concept within a week. There was very little for me to compare the LD and ED students with the non-LD or non-ED students because I didn't substitute for a 7<sup>th</sup> grade math class that had no LD or ED students. I only gave quizzes at the end of the week of me teaching the LD and ED students. There needs to be some extra instruction for those substitutes that will be

covering for the Special Education teachers to ensure the students have the understanding of the teacher.

It is helpful to see the differences of the students I form the different types of schools, in the way they view substitute teachers. Within my journal, the times I substituted at Flint Hill School, the attitudes of the students is geared toward more serious school work than most of the students within the Fairfax County Public School District. There could be some other influences that cause students to care more or less about school. Some of these could be age of the students, the type of upbringing the students have, or the type of friends they have.

The quiz scores for both the math and safety lessons can also show how effective I can be as a substitute teacher. Examples of tests scores that I collected with the quizzes show that students have a better grasp on topics when they feel comfortable with the person that is teaching them. There were 43% of the students in the small group math class that didn't pass the inequalities section of math, but 100% of the students passed in math class. This could mean many different things, the teacher with whom I team taught was a highly effective teacher, the students were more willing to learn, or just not all students learn at the same rate or way. The small group students didn't listen the entire class time or even half the class time. The majority of the students were disruptive in the class and I repeatedly told them to stop it and pay attention. Of course there were a couple of students in each of the classes that were in class to learn and that I was pleased to teach. The small group students I had to repeat myself over and over again to try to get them to stay focused. For the students that want to be in school to learn I believe the repetition will help them learn, but for the students that are there because they have to be

just become a distraction to everyone else in the class. My effectiveness depends on the willingness of the students to learn. I believe with some of the students I was able to get through to them, so I was an effective teacher for them. The other students whom I was unable to get through to I was less effective. The safety quiz was taken by 174 students. The questions looked at the percentage of students that gave the correct answer to the quiz questions. The question about cleaning up a clear liquid only 61% responded correctly, wearing goggles for safety only 72% chose the right answer, eating and drinking in the lab all but 10% got the answer wrong, 93% answered correctly for the mandatory use of flip flops, and all of the student said there must be a teacher being present when a lab is being conducted. With regards to the flip flop question, the video showed the guy dropping a beaker on his foot and his foot gushing blood, so I believe that was a catchy way to get the students attention and have them remember why it was bad for them to wear flip-flops. I believe that the students became confused with some of the questions, which happens regularly. Many times students rush through quiz questions and turn the responses around and give the wrong answers. I found students don't read and follow directions and they also tend to read too much into a question or over think the answer. I think we as substitute teachers need to do the best we can to teach all the students and not just a certain population. The lack of concentration occurs whether you are a contracted teacher or a substitute teacher.

The students in the 7<sup>th</sup> grade math class that I substituted had other distractions to their learning that just the subject content. It can take specialized training to ensure teachers and substitute teachers can be in a classroom. Personally I found the learning disabled, type of student, I substituted for was the most difficult. The students, who had

disabilities, were difficult to reach in many different ways. The students easily lost focus when I was lecturing, they just didn't want to learn, other students pushed them to be the worst they could be in a substitute's presence, and they just didn't have the desire to learn or even be in school. Also during the time I spent in the small group classroom the students took a quiz at the end of the week and there was another teacher that entered to help and they weren't any more respectful with her in the classroom. I believe from the beginning I need to be stricter with those students to ensure they are respectful to me as the substitute and the other students. I need not to be as friendly with the students. I am also learning something about myself and how I handle students and their learning. I believe students themselves need to take a large role in their learning. I, as a teacher, am not there to baby them. They need to take responsibility of their own learning in some ways, but with the guidance of the instructor/teacher. I believe this to be true because I started teaching at a college and have moved to substitute teaching. I found teaching at the college level that students weren't able to apply what they have learned to a scenario. Most students need to be hand held through all of the lessons they are learning, so with that being said, when I enter a class room as a substitute teacher I tell the students what needs to be done and expect them to do it. I tend to give them a lot of freedom because they need to learn and know how to get things done when there are distractions. I would say the main data that might support this was the math quiz scores for the quiz in the 7<sup>th</sup> grade math class, and in my journal I had written about the same class just not being respectful and lack of attention. With these students being easily distracted their class work wasn't fully completed and their homework was rarely done. I continually repeated

myself to try to keep them on task, but it wasn't easy for them or me to be overly focused.

Contracted teachers, substitute teachers, and students have different thoughts on what an effective teacher is or could be. There are so many if ands or buts with substitute teaching. If I make the teachers happy, the students tend not to like you. If the students like you the teachers question if you are an effective teacher. I actually was told that by one of my friends that is a teacher and also I received an email telling me "the students really seem to like you, but that isn't always a good sign." She seemed to appreciate the work, but then further in the email was wondering why her roomed seemed to be a mess. That brings out a totally different problem for substitutes. How should rooms be left, do we pick up after the students or do the students clean up after themselves, or what are all of the things the teacher's we substitute for want? I also had a contracted teacher just not appreciate anything I did since I wasn't as strict as she would have liked. I believe you can play both sides of the coin, but you need to show the students whose boss right from the beginning and don't let them take advantage of you. I believe this to help gain respect from both the students and the teachers. I think I found substitutes truly need more training to help them deal with students. Since not all substitute teachers are former teachers or even employees that want to be teachers they need to know what is expected of them in a classroom.

Coming into substitute teaching I thought I could handle whatever the students would throw at me, I felt in their eyes I could be an effective teacher. I am thinking that a lot of my substitute interactions with the students is fun because of the way my teaching philosophy. I am reminded every time I substitute teach at the middle school that I

believe the students really like me, but of course that isn't the best thing when it comes to the teachers liking me as the substitute. I found that some of the teachers really liked me coming into their classes and actually teach the children, and then others that didn't think I did a good enough job even though the students did well on their quizzes. My teaching approach is different probably due to how I started my teaching career. I expect the students to take a lot of responsibility for their learning and not have me spoon feed them the information. I had substitute taught in a math class before a math test and then another substitute teacher stepped into the class before a test and the teacher said, "I should have had you substitute for me." Most of the students had to retake the quiz to actually pass it, where when I substituted the math class it didn't seem like the students had the same problem. It made me feel good about the students learning. I believe that my view on teaching is much different than teachers who teach at the middle school and high school level, especially since I have taught at a higher level of education. I hope to get some more insight about being a better teacher by substitute teaching.

## VALUE

I wished I had more time to collect more information from teachers and talk with administration about their thoughts about finding substitute teachers for science and math classes. I believe we need to try to arrange training sessions for substitute teachers not just for specific subjects, but also on how to handle students. Coming into a new setting can be unnerving for anyone, but when dealing with pre-teens and teens, this takes a very special person. Having some knowledge about what to expect in a classroom would help out new substitutes to find out what type of teacher they want to be.

The main thing that would help substitute teachers is to know what lesson/topic the teacher is covering ahead of time. This would allow the substitute teacher to be able to be effective in their teaching. When I performed the planned safety lesson I believed it didn't work in the way I had thought.

Is there a real difference when the contracted teacher is in the room when a prepared lecture is being given to the students? The students seemed more focused to my teaching since their teacher was present. When she left the room their behavior seemed to turn and it took me some time to get them to refocus on the lecture. The teacher was still present, which gave the students assurance that they really didn't have to retain the information I was giving them. Also they weren't being graded on my lesson, so they really could care less.

Personally I felt very inadequate when I substituted in the Physics classes because of my lack of knowledge in that area of study. Substitutes should get more training when they aren't specialized or even understand the topics they might be substituting.

Some other questions that I came across were:

What if you find a math or science teacher has been giving the students wrong information?

How do you address it with the students, when you are not given adequate time to prepare for the science or math lesson? When your teaching style conflicts with the teaching style of the contracted teacher how do you reach a middle ground to ensure everyone is pleased?

How can you change the way substitute teachers are perceived by students, teachers, and administration?

Substitute teachers are in big demand, but their qualifications and training need to improve. Just like me feeling like a fish out of water in the Physics class most substitute teachers are out of place in some other subjects too. To be confident in the substitute teachers there needs to more information given and training to ensure the best quality of teaching for our students.

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APPENDICES

APPENDIX A  
TEACHER SURVEY

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1. What do you want a substitute teacher to accomplish during his/her time in class?
2. Do you expect your substitute teacher to carry out your lessons for your math class to the "T?"
  - a. Do you believe the lesson plans that you give a substitute teacher is enough information to teach the math class as you would? Give some examples of how it could be improved.
3. In the past have you had a difficult time finding an adequate substitute teacher to actually teach your students math? Why could this be?
4. How effective do you want a substitute teacher to be? Give some examples of how it can be accomplished.
5. How do you think students perceive a substitute teacher?
6. Do you expect feedback from your substitute and what kind of details are you looking for?

APPENDIX B  
STUDENT SURVEY

What is your overall impression of substitute teachers, based on previous experiences?

What expectations do you have in a class with a substitute teacher?

What do you find to be the most disruptive in having a substitute teacher?

What would be most valuable for you during a class with a substitute teacher?

APPENDIX C

STUDENT QUESTIONNAIRE

1. Did you know that your regular teacher would not be in today? Y N
2. Do you expect to learn something new in this math class? Y N Explain.
3. Do you believe substitute teachers are as knowledgeable in the subject of math as your own teacher? Y N Give some examples.
4. Are substitute teachers disruptive in a class? Y/N Give examples.

APPENDIX D

SELF-CONFIDENT QUESTIONNAIRE

<b>Question</b>	<b>Do not agree</b>	<b>Slightly do not agree</b>	<b>No difference</b>	<b>Slightly agree</b>	<b>Strongly agree</b>
Do you automatically give your substitute teacher respect?					
Do you believe a substitute teacher is only there to act as a babysitter?					
Do you like a substitute teacher to bring some new information to you about the topic of science that you are covering?					
Do you gain more respect when the substitute teacher knows the information and presents it to you so you understand it?					
Do you like being taught by the substitute teacher?					

APPENDIX E

POST-QUIZ TO SAFETY LESSON

1. When there is clear liquid on the floor you can just wipe it up T or F.
2. True or False when working with chemicals you must wear safety goggles.
3. True or False can you eat or drink in a science lab.
4. Flip flops are mandatory when in lab. T or F
5. Only perform a laboratory experiments when a teacher is present. T or F

APPENDIX F  
SAFETY SLIDES

## Safety? Why It's Important?



## What do we know about safety in a science class?

### Rules in the laboratory

- Have students sign contract
- Examples
  - No eating or drinking
  - No smoking
  - Wear mandatory equipment

Give them a handout of the rules. Have the students read the rules and then read them out loud to them. Cover any questions they might have. Ask questions like, what

happens if there is a spill, what if something catches on fire, do you know where the safety equipment is.

## Hazards

- Chemicals
  - Acids
  - Bases
  - Ingesting
  - Contact
  - Burns
  - Inhalation
- Life sciences
- Physical Sciences
- Fire
- Glassware

Talk about combining acids and bases to water. The proper way is to add acid to water.

Remember some chemicals produce exothermic reactions, so heat is released. Of course you don't eat any chemicals. Working with fire, be careful not to set anything on fire, such as: hair, clothing, or paper. Lab coats to prevent clothing to be ruined. Enough ventilation, no open toed shoes, wear gloves when appropriate Lab coats to prevent clothing to be ruined. Wear safety goggles. Proper ventilation, proper glassware.

APPENDIX G

YOUTUBE VIDEO LINK

The link to the video I showed the 8th grade students.

<http://www.youtube.com/watch?v=cr7roogzM8c>

APPENDIX H

SAFETY CONTRACT

## Student Laboratory Safety Contract

You and your classmates will be participating in many hands-on laboratory activities this year. Some of these activities may require the use of materials or pieces of equipment that are potentially harmful if not handled in a safe manner. Carefully review the following rules for student conduct that have been adapted from the Chemical Hygiene Plan prepared by the FCPS Office of Safety and Security. After you have reviewed these rules with your instructor, sign the statement indicating you understand and agree to follow these rules. Review these rules with your parents/guardians and have them sign the form, indicating that they understand the risks and rules you will follow and support your adherence to these safety rules.

1. No unauthorized experiments are permitted. Do not modify or change the design of your experiment without instructor written approval. Students lack skill in the laboratory and could injure themselves with equipment or chemicals.
2. Avoid loose fitting clothing, open-toed shoes or sandals, dangling jewelry, and tie back long hair. Ponytails that could fall over the shoulders must be folded over and tied. Loose clothing and hair can catch on fire or catch on equipment or chemical flasks causing accidents.
3. Wear appropriate eye protection at all times. Notify your instructor if you are wearing contact lenses. (If you splash chemicals in your eyes, notify the instructor immediately and begin flushing the eyes for 15-30 minutes with water at the eye wash station). Chemicals and sharp objects can damage eyes if not protected.
4. Absolutely no horseplay of any kind is permitted in the labs. This can cause accidents.
5. No visiting by friends is allowed during lab sessions. Keep your attention on the laboratory at hand – more attention equals fewer accidents.
6. Eating, drinking, applying cosmetics, chewing on pencils or fingernails, is never permitted in the labs. Assume everything in the lab is contaminated. Wash your hands before leaving the lab. Eating or drinking in the lab could allow you to ingest poisons. Washing hands before leaving the lab prevents your taking trace chemicals to other locations.
7. Do not deliberately smell or taste chemicals unless instructed to do so. When testing odors use a wafting motion of your hand to direct the odors to your nose.
8. Some organic solvents are highly flammable. No flames are to be used unless directed to do so by the instructor, and then only when it is certain that no flammable solvents are present. Follow your teacher's instructions when heating any liquid to avoid fires. Handle flammable liquids with extreme care.

9. Burners and hot plates require special care. Never leave a heat source unattended when in use. Remember that burners, hot plates, and heated apparatus can remain very hot long after heating so handle them carefully. Be aware of cords and heating surfaces. Keep them in a place where they are less likely to get pulled off the table or burn someone. If a fire alarm occurs, turn off the hot plate.
10. Never look directly into a test tube or flask and never point the opening of such a vessel at anyone, especially while heating its contents. Do not use fingers as rubber stoppers. Liquids can quickly become boiling hot when heated in a confined space. This can cause the contents to eject forcefully from the tube.
11. Read the bottle labels carefully and thoroughly. Always verify that you have selected the correct chemical. Report unlabeled chemicals to the laboratory instructor. Mixing the wrong chemicals together can sometimes cause unwanted (harmful) reactions.
12. Do not mix reagents unless you are instructed to do so. Mixing the wrong chemicals together can sometimes cause unwanted (harmful) reactions.
13. Never contaminate reagents by pouring unused portions into stock bottles. Give remainder to another workgroup or dispose of it according to directions from your instructor. Pouring unused reagents back into the stock bottle will contaminate the contents.
14. Follow waste disposal procedures specified by your instructor. Do not dump chemicals into trashcans or wash down drains. Your instructor will indicate when a chemical may be washed down the drain. All other waste chemicals are to be deposited in a properly labeled waste container. If you aren't sure – ASK!
15. Clean up broken glass immediately using tongs, gloves, or wisk broom. Never pick up broken glass without gloves or tools. Protect the custodians by disposing of glass in a puncture-proof waste container such as a coffee can or strong cardboard box. Notify your teacher if any breakage occurs. He/she will supervise safe cleanup.
16. If you spill material, notify your teacher. (Spillage of acids or bases requires neutralization before clean up. Notify your instructor immediately if you spill an acid or a base). Always FIRST notify your teacher of any chemical spills. She/he will supervise safe cleanup.
17. Promptly wash skin if contact is made with any chemical, regardless of corrosivity. (Notify your instructor if you get any chemical on your skin). Always wash hands before leaving the lab. Chemical burns must be washed with running water for 15-30 minutes.
18. Immediately report any unusual odors, broken equipment, or unsafe situations to the instructor.

19. Immediately report any spill, cut, burn or other injury to the instructor. Avoid contact with blood.
20. No chemicals or supplies may be taken from storerooms or labs for home use unless approved by teacher for independent (science fair) projects.
21. Know the location and use of the following laboratory safety equipment: eye wash station, fire extinguisher, safety shower, first aid kit
22. Know the basic procedures to be followed in the event of a fire at your lab table, fire on a person, cut or chemical burn, or chemical in the eyes

I, \_\_\_\_\_, have read and reviewed the  
FCPS Middle School

(student **print** and **sign** name above)

Laboratory Safety Contract and agree to comply with these rules any time I am in a science classroom. I will follow the oral and written instructions provided by the instructor and will cooperate to the fullest extent with my instructor and fellow classmates to maintain a safe lab environment.

I/We, \_\_\_\_\_, the parents/guardians of the above  
named student, have read and

(parents/guardians, **print** and **sign** name above)

reviewed these rules and support our child's adherence to these rules whenever he/she is in a science classroom, and will instruct our dependent to uphold his/her agreement to follow these rules and procedures in the laboratory.

Teachers Name:

School:

Subject/Grade:

September 7, 2010